

# Lamp Industry Product Stewardship and Disposal Labeling

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# Mercury in Lamps

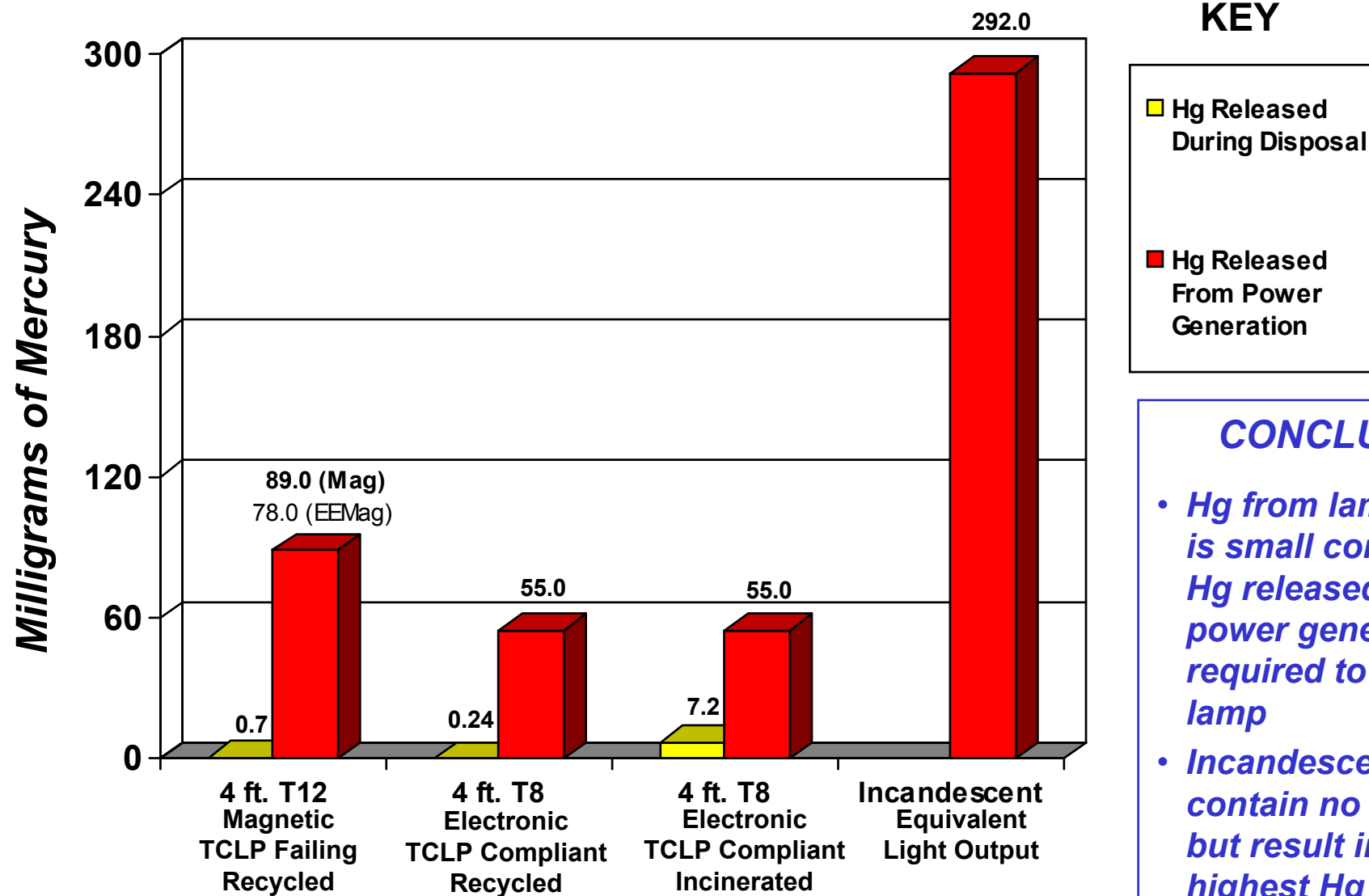
Which lamps?

- Fluorescent
- High Pressure Mercury
- Metal Halide
- High Pressure Sodium (most)
- Cold Cathode (“neon signs”)

# Purpose of Mercury in Lamps

- Fundamental to efficient operation of fluorescent lamps
  - Efficiently generates ultra-violet radiation that is converted to visible light by the phosphor
  - A “no-mercury” fluorescent lamp loses ~ 70% efficiency
  - No near-term prospect for elimination of mercury
- Metal halide and most HPS use mercury as starting aid and voltage control
  - Some prospects for elimination, e.g:
    - Hg-free HPS
    - Vehicle Headlights

# Lifetime Mercury Emissions \*



\*Based on 20K burning hours, Hg content of 23 mg per T12 lamp, and 8 mg per T8 lamp.  
Hg content of fuels is the US weighted average for fossil and non-fossil fuels,  
calculated from "Environmental and Health Aspects of Lighting: Mercury" J.IES 1994.  
Disposal emissions assume 3% in residuals of recycling, 90% from incinerators without controls.

# Product Stewardship

- Mainstream Lamp Industry Action
  - Minimizing Mercury Content
  - Increasing Product Life
  - Improving Efficiency
  - Encouraging Recycling
  - Providing Disposal Information

# Minimizing Mercury Content

- Mercury reduction began in mid-80's
- Since 1990,
  - 67% mercury content reduction overall
  - 80% mercury content reduction in mainstream fluorescent
- Mercury content under constant review
  - Further reductions can influence life and light output
- Industry uses 100% recycled mercury

# Increasing Product Life

- 50% increase in life of mainstream fluorescent, since mid-90's
  - 20,000 hours now increased to 30,000+ for popular T8 types
- Increased life of several HID lamp types, especially lower wattages
- Conservation of resources and waste minimization are the direct results of increased product life

# Improving Efficiency

- Fluorescent efficiency improvements:
  - 40-50% improvement over older magnetic systems
    - Rare-earth phosphors
    - Electronic ballasts
    - Smaller bulb diameters (T8, T5)
- Metal halide efficiency improvements:
  - Pulse-start technology
  - Ceramic arc tubes



# Encouraging Recycling

- Developed [www.lamprecycle.org](http://www.lamprecycle.org)
  - Launched in January 2000
  - One-stop resource for recycling and applicable state/provincial regulations
  - Linked to [www.almr.org](http://www.almr.org)
- Obtained \$2M appropriation for EPA to educate business users on lamp recycling (LROP)
- Lamp recycling promoted by individual manufacturers, and through their distributor networks

# Providing Disposal Information

- A major logistical challenge, due to
  - Large number of manufacturers
  - Independent distribution system
  - Universally used inexpensive commodity
  - Deemed hazardous when “spent”
- A major political/legal challenge due to the disparity of individual state and provincial regulations
  - Analysis of the current U.S. and Canadian “Federal regulations” will show why .....

# The U.S. Universal Waste Rule -- Lamps

- Intent
  - Makes recycling of lamps easier
  - Allows streamlined storage, collection, and transportation
- Challenges
  - Allows each state to vary requirements
  - Many lamps have inadvertently been exempted
- Result
  - No simple advice has been possible on how to dispose of lamps

# User Confusion

“Proper” disposal in the U.S. depends on:

*Who you are* (e.g., Household exemption)

*Where you are* (e.g., Which state)

*What type of lamp* (e.g., TCLP compliant or not)

*How many lamps* (e.g., Small quantity exemptions)

*Other wastes* (e.g., May have to be included in the lamp total)

# Canadian Confusion

- No equivalent of the US UWR
- Provincial requirements are not consistent
- Some voluntary recycling established
- Product stewardship proposals emerging
  - Manitoba, Ontario, Quebec
- 2000 Industry agreement with CCME on source reduction
  - 80% by 2010, using 1990 as the baseline


# The lamp disposal label



**LAMP CONTAINS MERCURY**

Manage in accord with disposal laws

See [www.lamprecycle.org](http://www.lamprecycle.org) or 1-800-xxx-xxxx

- Internet-based
- Is universal for all states/provinces
-  is marked on the lamps
  - Some lamps exempt, due to size or thermal limitations
- Label includes company-specific toll free number
- For consistency, NEMA encourages non-NEMA manufacturers to adopt same labeling plan

# Cradle to Grave

*“It is not the use of fluorescent lamps that is the problem, it is their proper disposal.”*

*New Hampshire Legislator, 2003*

*“I’m going to continue to put this stuff in the trash until I’m busted.”*

*Chicago High-rise Building Owner, 2003*

Industry has addressed the “cradle” issues.

The “grave” issues require two elements:

- Development and enforcement of consistent disposal laws
- Education